

New Australasian species from subgenus *Eusynaldis* of the genus *Aspilota* Foerster 1863 (Hymenoptera, Braconidae, Alysiniinae) with a key to World species

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Abstract

A new species of braconids from Papua New Guinea, *Aspilota (Eusynaldis) villemantae*, sp. nov., is described and illustrated. A key for determination of the World *Eusynaldis* species with new generic combinations is provided. Additionally, the following new combinations are suggested: *A. (E.) brunicorpus* (Fischer 2003), comb. nov., *A. (E.) capensis* (Peris-Felipo 2014), comb. nov., *A. (E.) cellabsentibus* Fischer et Samuddin 2008, comb. nov., *A. (E.) claricornis* (Fischer 1993), comb. nov., *A. (E.) correcta* (Papp 2007), comb. nov., *A. (E.) crassimembris* (Fischer 2003), comb. nov., *A. (E.) crassithorax* (Fischer 2003), comb. nov., *A. (E.) cultrata* (Belokobylskij 2002), comb. nov., *A. (E.) gigascapus* (Fischer 1993), comb. nov., *A. (E.) grimmorum* (Fischer 2014), comb. nov., *A. (E.) knysnaana* (Fischer 2003), comb. nov., *A. (E.) magnareata* (Fischer 1993), comb. nov., *A. (E.) maxfischeri* (Peris-Felipo 2012), comb. nov., *A. (E.) mesoafricanus* (Peris-Felipo 2014), comb. nov., *A. (E.) moniliata* (Belokobylskij 2002), comb. nov., *A. (E.) nanocorpus* (Fischer 2014), comb. nov., *A. (E.) noyesi* (Peris-Felipo 2014), comb. nov., *A. (E.) pacifica* (Belokobylskij 2002), comb. nov., *A. (E.) paraclypealis* (Fischer 1967), comb. nov., *A. (E.) propoglabra* (Fischer 1993), comb. nov., *A. (E.) resurrectionis* (Fischer 1993), comb. nov., *A. (E.) rugipropodeum* (Fischer 2003), comb. nov., *A. (E.) ryukyuensis* (Belokobylskij 2002), comb. nov., *A. (E.) spasskensis* (Belokobylskij 2002), comb. nov., *A. (E.) spiritalis* (Tobias 1992), comb. nov., *A. (E.) striatipetiolata* (Fischer 2003), comb. nov., *A. (E.) subsurrectionis* (Fischer 2003), comb. nov., *A. (E.) trematosa* (Fischer 1967), comb. nov.. *Regetus balcanicus* Papp 1999 is a junior synonym of *A. (E.) globipes* (Fischer 1962) (syn. nov.).

Key words: Braconidae, parasitoid, *Eusynaldis*, Australasia, new species, key.

Introduction

The subgenus *Eusynaldis* Zaykov et Fischer 1982 (including *Regetus* Papp 1999 and *Adelphenaldis* Fischer 2003) (Zhu *et al.*, 2017) of the genus *Aspilota* Foerster 1863 is composed of 32 species distributed in almost all zoogeographic regions except the Neotropical one.

Originally the most part of current *Eusynaldis* species were mainly included in the genera *Regetus* and *Adelphenaldis* (Papp, 1999; Fischer, 2003). However, due to the revision of the types and the study of numerous additional materials, the two last generic names were synonymized with *Eusynaldis*, which had been treated as subgenus of *Aspilota* (Zhu *et al.*, 2017).

In the present work, a new species from Papua New Guinea, *Aspilota (Eusynaldis) villemantae* sp. nov., is described and illustrated. A key for determination of the World *Eusynaldis* species with new generic combinations is provided.

Materials and methods

Specimens were collected with Malaise traps during the expedition "Our Planet Reviewed - Papua New Guinea" carried out from 25 October to 10 November 2012 at eight sites placed every 500 m along an altitudinal transect set up on the north-eastern face of Mt Wilhelm and at Wanang (Swire) Research Station (175 m a.s.l.), a

lowland forest distant of 63 km north of Mt Wilhelm. At each sampling site, four Malaise traps were set up every 100 m following the same contour line. The captures were preserved with 90% ethyl alcohol (Robillard *et al.*, 2016).

For the terminology of morphological features, sculpture and measurements, see Peris-Felipo *et al.* (2014a); for wing venation nomenclature, see van Achterberg (1993); for measurements of the marginal cells, see Peris-Felipo and Belokobylskij (2017). Material was imaged using a Digital Microscope Keyence® VHX-2000 and Adobe Photoshop® imaging system. The types of a described species are deposited in the collection of the Muséum National d'Histoire Naturelle (Paris, France; MNHN) and the Zoological Institute of the Russian Academy of Sciences (St Petersburg, Russia; ZISP).

Taxonomic part

Order Hymenoptera L. 1758

Family Braconidae Nees 1811

Subfamily Alysiniinae Leach 1815

Tribe Alysini Leach 1815

Genus *Aspilota* Foerster 1863

Subgenus *Eusynaldis* Zaykov et Fischer 1982

Eusynaldis Zaykov et Fischer, 1982: 70; van Achterberg, 1988: 9; Zhu *et al.*, 2017: 59.

Regetus Papp, 1999: 391 (type species: *Regetus balcanicus* Papp 1999) (synonymised by Zhu *et al.*, 2017: 59); Fischer, 2002: 101.

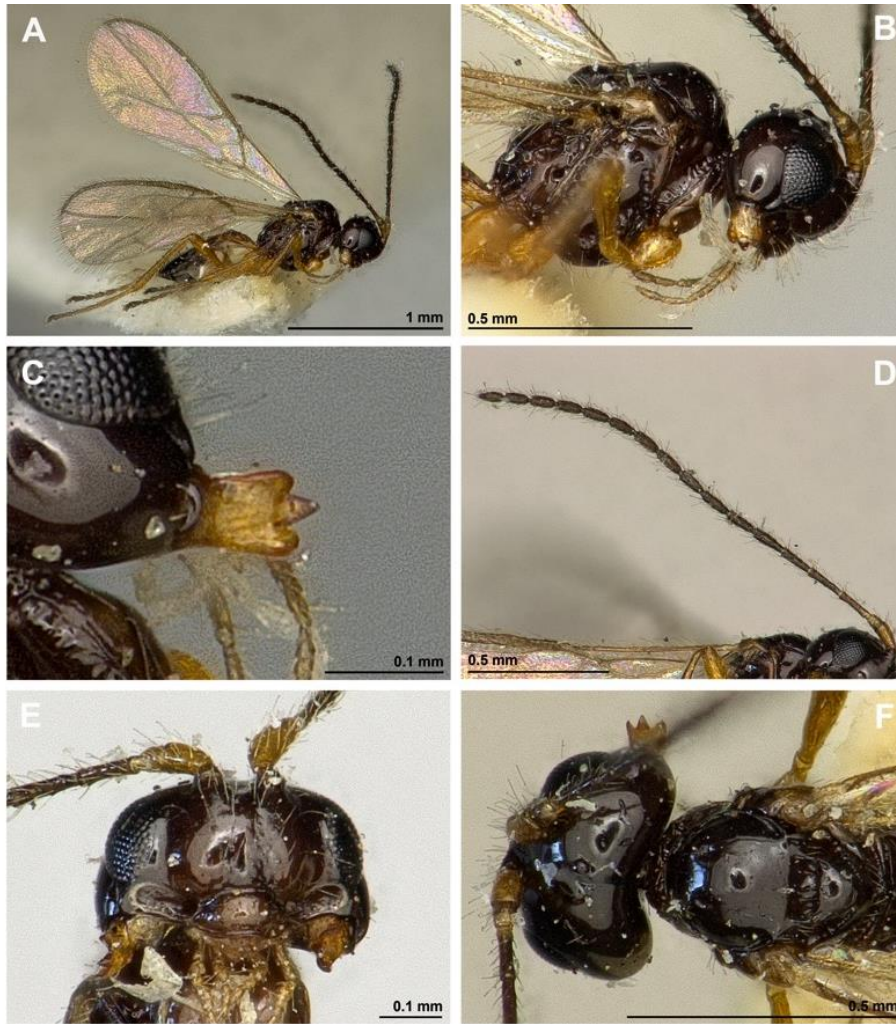


Figure 1. *Aspilota (Eusynaldis) varinervis* (Zaykov et Fischer 1982) (male, holotype). A. Habitus, lateral view. B. Head and mesosoma, lateral view. C. Mandible. D. Antenna. E. Head, front view. F. Head and mesonotum, dorsal view.

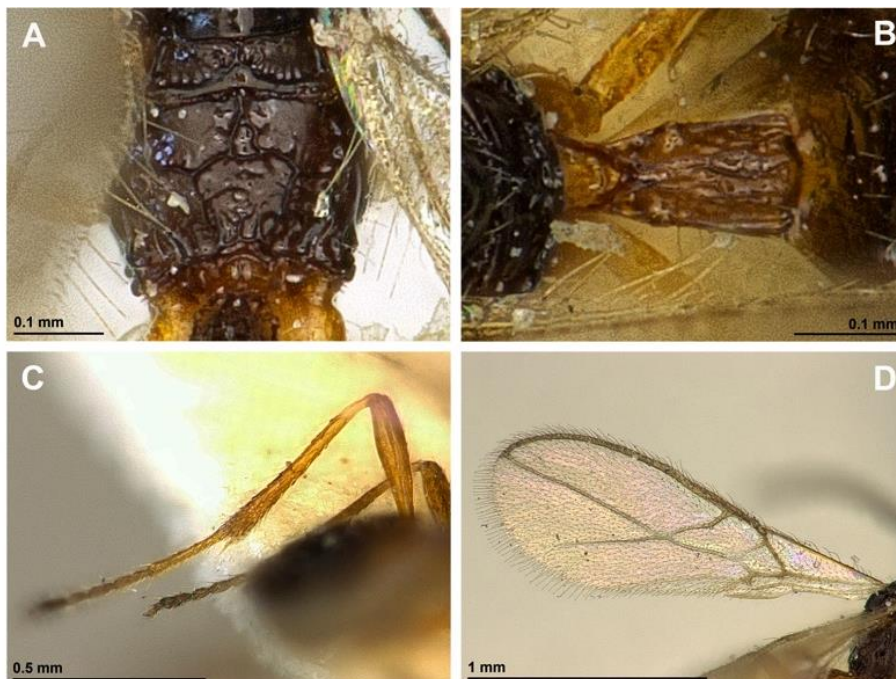


Figure 2. *Aspilota (Eusynaldis) varinervis* (Zaykov et Fischer 1982) (male, holotype). A. Propodeum, dorsal view. B. First metasomal tergite, dorsal view. C. Hind leg, lateral view. D. Fore wing.

Adelphenaldis Fischer, 2003: 41 (type species: *Adelphenaldis brunnicorpus* Fischer 2003) (synonymised by Zhu *et al.*, 2017: 59); Peris-Felipo *et al.*, 2012: 287; 2014b: 571; Fischer, 2014: 103.

Type species: *Eusynaldis varinervis* Zaykov et Fischer 1982, by monotypy (figures 1, 2).

Diagnosis: Subgenus *Eusynaldis* has main diagnostic characters of *Aspilota* s. str. (long paraclypeal fovea reaching inner border of eye, mandible with three teeth and without transverse curved carina), but with main difference from the later in the vein 2-SR of fore wing which is always absent.

Remarks: *Regetus* and *Adelphenaldis* are junior synonyms of *Eusynaldis* because all three taxa are characterized by the same generic diagnostic features (Zhu *et al.*, 2017). Moreover, the careful study of the holotype of *Regetus balcanicus* Papp 1999 clearly showed that this species is a junior synonym of *Aspilota (Eusynaldis) globipes* (Fischer 1962) (syn. nov.).

Hosts: Perhaps the members of the families Phoridae and Platypezidae (Diptera) as well as in some species of subgenus *Aspilota* s. str. (Zhu *et al.*, 2017).

***Aspilota (Eusynaldis) villemantae* Peris-Felipo, sp. nov.** (figures 3, 4)

Type material

Holotype: female, Papua New Guinea, Mt Wilhelm, UTM (-5.731961, 145.2522), 700 m, 23-24.v.2013, understorey, Coll. by Sam *et al.*, site: MW0700-04, P4759, vial: 20620, MAL-MW0700'D-11/16-d11 (MNHM).

Paratypes: 1 female, same data as holotype (ZISP); 1 female, same locality as holotype but, 25-26.v.2013, site: MW0700-03, P4745, vial: 20602, MAL-MW0700'C-13/16-d13 (MNHM).

Description

Female (holotype)

Head - In dorsal view, 2.0 times as wide as long, 1.5 times as wide as mesoscutum, smooth, with temple rounded behind eyes. Eye in lateral view 1.4 times as high as wide and 1.5 times as wide as temple medially. POL equal to OD; OOL 2.7 times OD. Face 1.3 times as wide as high, with spared setae; inner margins of eyes subparallel. Clypeus 2.3 times as wide as high, slightly concave ventrally. Paraclypeal fovea long, reaching inner border of eye. Mandible almost parallel-sided, 1.6 times as long as its maximum width. Upper tooth very small; middle tooth rather narrow and short, directed weakly upwards; lower tooth small, with several long outstanding curved setae. Antenna 21-segmented, 0.9 times as long as body. Scape 2.2 times as long as pedicel. First flagellar segment 3.4 times as long as its apical width, 1.3 times as long as second segment. Second flagellar segment 2.0 times, third segment 1.8 times, fourth to 19th (apical segment) 1.6-1.7 times as long as their maximum width.

Mesosoma - In lateral view 1.3 times as long as high. Mesoscutum (dorsal view) about as long as its maxi-

um width, smooth. Notauli in horizontal surface of mesonotum absent. Mesoscutal pit absent. Prescutellar depression smooth, with median and lateral carinae, 1.5 times as long as its maximum width. Precoxal sulcus present, crenulate, not reaching anterior and posterior margins of mesopleuron. Posterior mesopleural furrow smooth. Propodeum with longitudinal carinae running from basal to subapical part when fused with short and angulated semi-round posterior area, basolateral areas smooth. Propodeal spiracles large, their diameter 0.4 times as large as distance from spiracle to anterior margin of propodeum.

Wings - Length of fore wing 2.5 times its maximum width. Marginal cell ending on apex of wing, 3.9 times as long as its maximum width. Vein SR1 3.1 times as long as vein 3-SR+r. Vein r longer than pterostigma width. First subdiscal cell 3.0 times as long as its maximum width. Hind wing 7.3 times as long as its maximum width.

Legs - Hind femur 4.5 times as long as its maximum width. Hind tibia weakly widened to apex, 6.9 times as long as its maximum subapical width, about as long as hind tarsus. First segment of hind tarsus 1.8 times as long as second segment.

Metasoma - First tergite curvedly widened towards apex, 2.2 times as long as its maximum subapical width, sparsely striate in apical half, finely rugulose in baso-median half. Ovipositor 1.2 times as long as first tergite, 0.5 times as long as metasoma, 0.8 times as long as hind femur.

Colour - Body, flagellar segments of antenna and pterostigma brown to dark brown. Mandible and legs light brown. First metasomal tergite similar colour to second and third tergites. Wings almost hyaline.

Length - Body 1.7 mm, fore wing 2.0 mm, hind wing 1.3 mm.

Variation - Body 1.7-1.9 mm, fore wing 2.0-2.1 mm, hind wing 1.3-1.4 mm.

Male

Unknown.

Etymology

Named in honour of Claire Villemant, well-known French entomologist from the Muséum National d'Histoire Naturelle (Paris).

Comparative diagnosis

This new species is similar to *A. (E.) mesoaffricanus* (Peris-Felipo 2014), comb. nov. from Kenya (Peris-Felipo *et al.*, 2014b) by propodeum without areola, mesoscutal dorsal pit absence, and rather long mandible, hind femur and first metasomal tergite. This new species differs from it in having the first flagellar segment 3.4 times as long as its maximum width (2.8 times in *A. mesoaffricanus*), head in dorsal view 1.8 times as long as wide (1.5 times in *A. mesoaffricanus*), eye in lateral view 1.5 times as wide as temple medially (1.0 times in *A. mesoaffricanus*), and face 1.3 times as long as high (2.0 times in *A. mesoaffricanus*).

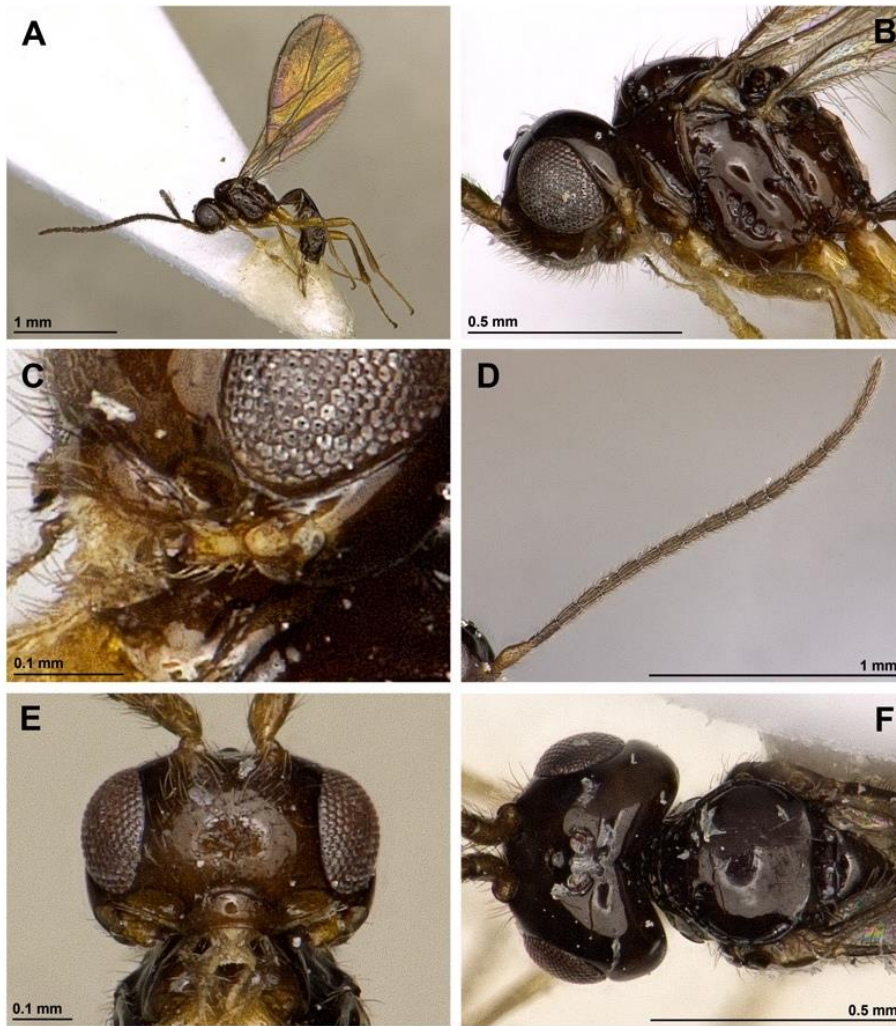


Figure 3. *Aspilota (Eusynaldis) villemantae* Peris-Felipo, sp. nov. (female, holotype). A. Habitus, lateral view. B. Head and mesosoma, lateral view. C. Mandible. D. Antenna. E. Head, front view. F. Head and mesonotum, dorsal view.

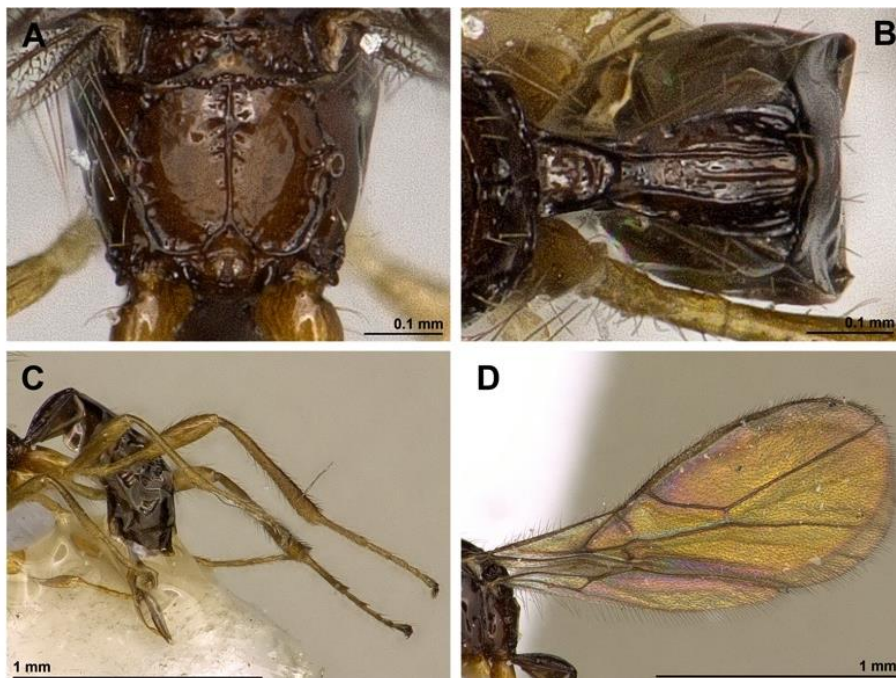


Figure 4. *Aspilota (Eusynaldis) villemantae* Peris-Felipo, sp. nov. (female, holotype). A. Propodeum, dorsal view. B. First metasomal tergite, dorsal view. C. Hind leg, metasoma and ovipositor, lateral view. D. Fore and hind wings.

Key to the World species of *Aspilota (Eusynaldis)*

1	- Propodeum with rather large median areola, distinctly delineated by carinae	2
--	- Propodeum without areola, only sometimes with short semi-round posterior area	17
2(1)	- Hind wing without medial and submedial cells. Body length 1.3 mm. India	3
--	- Hind wing with medial and submedial cells	3
3(2)	- Propodeal spiracles large, their diameter equal or almost equal to distance from spiracle to base of propodeum	4
--	- Propodeal spiracles small, their diameter distinctly less than distance from spiracle to base of propodeum	10
4(3)	- First metasomal tergite linearly striate at least in apical half	5
--	- First metasomal tergite smooth or irregularly sculptured, never linearly striate	6
5(4)	- First metasomal tergite 3.3 times as long as its apical width. Hind femur 4.0 times as long as its maximum width. Body length 1.5 mm. India	6
--	- First metasomal tergite 2.2-2.4 times as long as its apical width. Hind femur 3.0-3.3 times as long as its maximum width. Body length 2.0-2.3 mm. Russia (Far East)	6
6(4)	- First flagellar segment long, 2.7-3.5 times as long as its width	7
--	- First flagellar segment short, 1.2-2.0 times as long as its width	9
7(6)	- First flagellar segment 2.7 times as long as its maximum width. First metasomal tergite 2.3 times as long as its apical width. Body length 1.7 mm. Korea	7
--	- First flagellar segment 3.2-3.5 times as long as its maximum width. First metasomal tergite 2.6-2.7 times as long as its apical width	8
8(7)	- Mandible 1.5 times as long as width. Mesosoma 1.3 times as long as high. Hind femur 3.6-3.8 times as long as its maximum width. Body length 1.8-2.2 mm. Russia (Far East)	7
--	- Mandible 1.7-2.0 times as long as width. Mesosoma 1.05-1.10 times as long as high. Hind femur 3.0-3.5 times as long as its maximum width. Body length 1.5-1.7 mm. Russia (North-West of the European part), Spain	8
9(6)	- Scape as long as first flagellar segment. First flagellar segment 2.0 times as long as its maximum width. Mandible 2.0 times as long as its maximum width. Body length 1.8 mm. USA	8
--	- Scape about 0.7 times as long as first flagellar segment. First flagellar segment 1.5-1.7 times as long as its maximum width. Mandible 1.50-1.85 times as long as its maximum width. Body length 1.1-1.5 mm. Bulgaria, China, Czech Republic, Georgia, Hungary, Italy, the Netherlands, Poland, Russia, Spain, Sweden	8
10(3)	- First flagellar segment 1.2 times as long as its maximum width. Body length 1.6-1.8 mm. Austria, Bulgaria, China, Finland, Germany, Hungary, Russia (Far East), Sweden, Switzerland	8
--	- First flagellar segment 2.5-5.0 times as long as its width	11
11(10)	- First metasomal tergite striate at least in apical half	12
--	- First metasomal tergite entirely or mostly smooth	14
12(11)	- Hind femur 5.0 times as long as its maximum width. First flagellar segment 5.0 times as long as its maximum width. Vein 3-SR and 2-M fused distally, without vein r-m between them. Body length 1.5 mm. Bulgaria	12
--	- Hind femur 3.8-4.3 times as long as its maximum width. First flagellar segment 3.5-4.5 times as long as its maximum width. Vein 3-SR and 2-M not fused distally, with vein r-m between them	13
13(12)	- First metasomal tergite long, 4.0-4.5 times as long as its apical width. Length of median antennal segments 3.0-3.3 times their maximum width. Areola of propodeum entirely in irregular sculpture. Body length 2.4-3.0 mm. Japan	13
--	- First metasomal tergite short, 1.4-1.6 times as long as its apical width. Length of median antennal segments about 2.0 times their maximum width. Areola of propodeum mainly smooth. Body length 1.6-1.9 mm. Russia (Far East), Japan	13
14(11)	- First flagellar segment 5.0 times as long as its maximum width. Head in dorsal view 1.5 times as long as wide. Body length 1.8 mm. Australia	13
--	- First flagellar segment 2.5-3.5 times as long as its maximum width. Head in dorsal view 1.8-2.0 times as long as wide	15
15(14)	- Mandible as long as wide. First flagellar segment 3.5 times as long as its maximum width. Eye in dorsal view 2.5 times as long as temple. Body length 1.5 mm. USA	14
--	- Mandible 1.5 times as long as wide. First flagellar segment 2.5 times as long as its maximum width. Eye in dorsal view 1.3-1.5 times as long as temple	16
16(15)	- Hind femur 5.0 times as long as its maximum width. Fourth flagellar segment 1.5 times as long as its maximum width. Body length 1.0 mm. La Réunion	14
--	- Hind femur 3.3 times as long as its maximum width. Fourth flagellar segment 1.7-1.8 times as long as its maximum width. Body length 1.3-1.4 mm. Kenya, Madagascar	15
17(1)	- First tooth of mandible distinctly widened towards apex. First metasomal tergite 1.5 times as long as its apical width. Body length 1.8 mm. Austria, China, Korea	15
--	- First tooth of mandible not or only weakly widened towards apex. First tergite 2.0-4.0 times as long as its apical width	18
18(17)	- Mesoscutum with dorsal pit	19
--	- Mesoscutum without dorsal pit	24

(continued)

(continued)

19(18)- First metasomal tergite striate at least in apical half	20
-- - First metasomal tergite mostly smooth	21
20(19)- Mandible 1.6 times as long as its maximum width. Propodeum smooth around median carina. Body length 2.0 mm. South Africa	<i>A. (E.) striatipetiolata</i> (Fischer), comb. nov.
-- - Mandible 1.2 times as long as its maximum width. Propodeum rugose-reticulate around median carina. Body length 2.0 mm. South Africa	<i>A. (E.) rugipropodeum</i> (Fischer), comb. nov.
21(19)- Vein 3-SR about as long as 3-SR+r. Middle antennal segments 1.5 times as long as their maximum width. Body length 1.5 mm. South Africa	<i>A. (E.) crassimembris</i> (Fischer), comb. nov.
-- - Vein 3-SR 1.9-2.2 times longer than 3-SR+r. Middle antennal segments 2.0-2.5 times as long as their maximum width	22
22(21)- Mesoscutum 1.4 times as long as broad. Hind femur 5.0 times as long as its maximum width. First flagellar segment 3.5 times as long as its maximum width. Body length 1.8 mm. South Africa	<i>A. (E.) knysnaana</i> (Fischer), comb. nov.
-- - Mesoscutum 1.20-1.25 times as long as broad. Hind femur 4.0-4.5 times as long as its maximum width. First flagellar segment about 3.0 times as long as its maximum width	23
23(22)- Middle antennal segments 2.5 times as long as their maximum width. Hind femur 4.5 times as long as its maximum width. Vein SR1 2.2 times longer than 3-SR+r. Body length 1.5 mm. Congo	<i>A. (E.) claricornis</i> (Fischer), comb. nov.
-- - Middle antennal segments 2.0 times as long as their maximum width. Hind femur 4.0 times as long as its maximum width. Vein SR1 1.9 times longer than 3-SR+r. Body length 2.2 mm. Ethiopia	<i>A. (E.) propoglabra</i> (Fischer), comb. nov.
24(18)- First metasomal tergite 3.0-4.0 times as long as its apical width	25
-- - First metasomal tergite 2.0-2.5 times as long as its apical width	26
25(24)- First metasomal tergite 4.0 times as long as its apical width. Middle antennal segments 2.0 times as long as their maximum width. Mandible 1.5 times as long as its maximum width. Precoxal suture crenulate. Body length 1.7 mm. South Africa	<i>A. (E.) crassithorax</i> (Fischer), comb. nov.
-- - First metasomal tergite 3.0-3.2 times as long as its apical width. Middle antennal segments 2.7-3.0 times as long as their maximum width. Mandible 1.7-2.0 times as long as its maximum width. Precoxal suture smooth. Body length 1.7-2.4 mm. Russia (Far East)	<i>A. (E.) cultrata</i> (Belokobylskij), comb. nov.
26(24)- Hind femur 4.0-5.0 times as long as its maximum width	27
-- - Hind femur 2.5-3.5 times as long as its maximum width	30
27(26)- Hind femur 5.0 times as long as its maximum width. - Mandible almost as long as wide. First flagellar segment 3.0 times as long as its maximum width. First metasomal tergite 2.0 times as long as its apical width. Body length 1.2 mm. South Africa	<i>A. (E.) brunicorpus</i> (Fischer), comb. nov.
-- - Hind femur 4.0-4.6 times as long as its maximum width	28
28(27)- Mandible 1.1-1.2 times as long as its maximum width. First flagellar segment 2.2 times as long as its maximum width. Body length 1.9-2.0 mm. South Africa	<i>A. (E.) capensis</i> (Peris-Felipo), comb. nov.
-- - Mandible 1.5-1.6 times as long as its maximum width. First flagellar segment 2.8-3.4 times as long as its maximum width	29
29(28)- First flagellar segment 2.8 times as long as its maximum width. Head in dorsal view 1.5 times as long as wide. Eye in lateral view as wide as temple medially. Face 2.0 times as long as high. Body length 1.7-1.8 mm. Kenya	<i>A. (E.) mesoaffricanus</i> (Peris-Felipo), comb. nov.
-- - First flagellar segment 3.4 times as long as its maximum width. Head in dorsal view 1.8 times as long as wide. Eye in lateral view 1.5 times as wide as temple medially. Face 1.3 times as long as high. Body length 1.7-1.8 mm. Papua New Guinea	<i>A. (E.) villemantae</i> Peris-Felipo, sp. nov.
30(26)- Hind femur 2.5 times as long as its maximum width. Ovipositor 0.7-0.8 times as long as first metasomal tergite. Body length 1.3-1.4 mm. Spain	<i>A. (E.) maxfischeri</i> (Peris-Felipo), comb. nov.
-- - Hind femur 3.0-3.5 times as long as its maximum width. Ovipositor 1.5 times as long as first metasomal tergite (unknown for <i>A. subsurrectionis</i>)	31
31(30)- First tooth of mandible without carinae. Body length 1.1 mm. Congo	<i>A. (E.) resurrectionis</i> (Fischer), comb. nov.
-- - First tooth of mandible with carinae	32
32(31)- Head in dorsal view 1.6 times as long as its wide. First metasomal tergite 2.5 times as long as its maximum width. Eye in lateral view as wide as temple medially. Face 1.75 times as long as high. Clypeus 3.5 times as long as high. Body length 1.5 mm. South Africa	<i>A. (E.) subsurrectionis</i> (Fischer), comb. nov.
-- - Head in dorsal view 2.0 times as long as its wide. First metasomal tergite 2.0 times as long as its maximum width. Eye in lateral view 1.5 times as wide as temple medially. Face 1.5 times as long as high. Clypeus 3.0 times as long as high. Body length 1.7 mm. La Réunion	<i>A. (E.) grimmorum</i> (Fischer), comb. nov.

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